

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

**Amendments to the Claims:**

This listing of claims will replace all prior versions and listing of claims in the application.

Claims 35-38 are canceled without prejudice or disclaimer.

Claim 3 is amended.

Claim 59 is new.

**Listing of Claims:**

1. (Original) An optical pick-up comprising:
- a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;
  - a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;
  - a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beams into a microscopic spot on an optical disk;
  - a diffractive element for diffracting the light beam reflected by the optical disk; and
  - a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,
- wherein the photo detecting portion comprises a photo detecting portion PD0 for receiving a +first order diffracted light from the diffractive element, and wherein a distance d1 between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source and a distance d2 between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source substantially satisfy the following relationship:
- $$\lambda_1/\lambda_2 = d_1/d_2.$$
2. (Original) An optical pick-up, comprising:

App. No. 09/898781

Pre. Amd. Dated June 25, 2004

a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;  
a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;  
a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beams into a microscopic spot on an optical disk;

a diffractive element for diffracting the light beam reflected by the optical disk; and  
a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,  
wherein the photo detecting means comprises a photo detecting portion PD0 for receiving a +first order diffracted light from the diffractive element, and a distance d1 between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source and a distance d2 between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source, and a distance d12 between the light emitting spots of the first and second semiconductor laser light sources satisfy the following relationship:

$$d2 = d1 + d12$$

and substantially satisfy the following relationships:

$$d1 = \lambda_1 \cdot d12 / (\lambda_2 - \lambda_1)$$

$$d2 = \lambda_2 \cdot d12 / (\lambda_2 - \lambda_1).$$

3. (Currently Amended) An optical pick-up comprising:

a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;  
a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;  
a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beam into a microscopic spot on an optical disk;

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

13  
a diffractive element for diffracting a light beam ~~reflected by the optical disk~~; and  
a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light, wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a ~~[[ - ]] first order~~ diffracted light of the light beam with wavelength  $\lambda_1$  in the diffracted light diffracted by the diffractive element, and a photo detecting portion PD2 for receiving a ~~[[ - ]] first order~~ diffracted light of the light beam with wavelength  $\lambda_2$  in the diffracted light diffracted by the diffractive element, and the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions respectively, and wherein when information reproduction is carried out by the use of the light with wavelength  $\lambda_1$ , signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal, and when the information reproduction is carried out by the use of the light with wavelength  $\lambda_2$ , signals obtained from the regions of the photo detecting portion PD2 are calculated to detect a focus error signal.

4. (Original) The optical pick-up according to claim 3, wherein the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

5. (Original) The optical pick-up according to claim 3, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by dividing lines, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

6. (Original) The optical pick-up according to claim 3, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

7. (Original) The optical pick-up according to claim 3, further comprising a grating that forms a main beam and a sub-beam that is a  $\pm$ first order diffracted light by receiving a light beam with wavelength  $\lambda_2$  emitted from the second semiconductor laser light source when the wavelength  $\lambda_1$  is set to be in the range from 610 nm to 670 nm, and the wavelength  $\lambda_2$  is set to be in the range from 740 nm to 830 nm,

wherein a grating cross-sectional shape of the grating is substantially rectangular having concave and convex portions, the width of the concave portion and the width of the convex portion are substantially the same, and a level difference  $h$  between the concave portion and the convex portion of the cross sectional shape is represented by the following relationship when  $n_1$  denotes a refractive index of a material of the grating with respect to the wavelength  $\lambda_1$ :

$$h = \lambda_1 / (n_1 - 1), \text{ and}$$

the level difference in an optical path between the concave portion and the convex portion is set to be one wavelength.

8. (Original) The optical pick-up according to claim 7, wherein in both of the light beam with wavelength  $\lambda_1$  and the light beam with wavelength  $\lambda_2$ , a light beam entering an objective lens constituting the converging optical system without being diffracted by the grating, forms grating stripes in the entire range satisfying a NA necessary to the reproduction of the optical disk.

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

- 31
9. (Original) The optical pick-up according to claim 3, wherein the wavelength  $\lambda_1$  is smaller than the wavelength  $\lambda_2$ , and the light emitting spot of the first semiconductor laser light source is arranged substantially on the optical axis of the converging optical system.
10. (Original) The optical pick-up according to claim 3, wherein the diffractive element has a focus error offset reducing region.
11. (Original) An optical disk apparatus comprising an optical pick-up according to claim 3, a moving mechanism for the optical pick-up, and a rotation mechanism for rotating the optical disk.
12. (Original) An optical pick-up comprising:  
a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;  
a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;  
a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beam into a microscopic spot on an optical disk;  
a diffractive element for diffracting a light beam reflected by the optical disk; and  
a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,  
wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a -first order diffracted light of the light beam with wavelength  $\lambda_1$  in the diffracted light diffracted by the diffractive element, and a photo detecting portion PD2 for receiving a -first order diffracted light of the light beam with wavelength  $\lambda_2$  in the diffracted light diffracted by the diffractive element; and a distance d1 between the center of the photo detecting portion PD1 and the light emitting spot of the first semiconductor laser light source and a distance d2

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

between the center of the photo detecting portion PD2 and the light emitting spot of the second semiconductor laser light source substantially satisfy the following relationship:

$$\lambda_1/\lambda_2 = d_1/d_2.$$

13. (Original) The optical pick-up according to claim 12, wherein when  $d_{12}$  denotes a distance between the light emitting spot of the first semiconductor laser light source and the light emitting spot of the second semiconductor laser light source, a gap between the center of the photo detecting portion PD1 and the center of the photo detecting portion PD2 is set to be twice  $d_{12}$ .

14. (Original) The optical pick-up according to claim 12, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions respectively, and when information reproduction is carried out by the use of the light with wavelength  $\lambda_1$ , signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal, and when the information reproduction is carried out by the use of the light with wavelength  $\lambda_2$ , signals obtained from the regions of the photo detecting portion PD2 are calculated to detect a focus error signal.

15. (Original) The optical pick-up according to claim 14, wherein the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

16. (Original) The optical pick-up according to claim 14, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by dividing lines, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

App. No. 09/898781

Pre. Amd. Dated June 25, 2004

17. (Original) The optical pick-up according to claim 12, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

18. (Original) The optical pick-up according to claim 12, further comprising a grating that forms a main beam and a sub-beam that is  $\pm$ first order diffracted light by receiving a light beam with wavelength  $\lambda_2$  emitted from the second semiconductor laser light source when the wavelength  $\lambda_1$  is set to be in the range from 610 nm to 670 nm, and the wavelength  $\lambda_2$  is set to be in the range from 740 nm to 830 nm,

wherein a grating cross-sectional shape of the grating is substantially rectangular having concave and convex portions, the width of the concave portion and the width of the convex portion are substantially the same, and a level difference  $h$  between the concave portion and the convex portion of the cross sectional shape is represented by the following relationship when  $n_1$  denotes a refractive index of a material of the grating with respect to the wavelength  $\lambda_1$ :

$$h = \lambda_1 / (n_1 - 1), \text{ and}$$

the level difference in an optical path between the concave portion and the convex portion is set to be one wavelength.

19. (Original) The optical pick-up according to claim 18, wherein in both of the light beam with wavelength  $\lambda_1$  and the light beam with wavelength  $\lambda_2$ , a light beam entering an objective lens constituting the converging optical system without being diffracted by the grating, forms grating stripes in the entire range satisfying NA necessary to the reproduction of the optical disk.

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

20. (Original) The optical pick-up according to claim 12, wherein the wavelength  $\lambda_1$  is smaller than the wavelength  $\lambda_2$ , and the light emitting spot of the first semiconductor laser light source is arranged substantially on the optical axis of the converging optical system.
21. (Original) The optical pick-up according to claim 12, wherein the diffractive element has a focus error offset reducing region.
22. (Original) An optical disk apparatus comprising an optical pick-up according to claim 12, a moving mechanism for the optical pick-up, and a rotation mechanism for rotating the optical disk.
23. (Original) An optical pick-up comprising:  
a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;  
a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;  
a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beam into a microscopic spot on an optical disk;  
a diffractive element for diffracting a light beam reflected by the optical disk; and  
a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,  
wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a -first order diffracted light of the light beam with wavelength  $\lambda_1$  in the diffracted light diffracted by the diffractive element; a photo detecting portion PD2 for receiving a -first order diffracted light of the light beam with wavelength  $\lambda_2$  in the diffracted light diffracted by the diffractive element; and a photo detecting portion PD0 for receiving a +first order diffracted light of the light beams with wavelength  $\lambda_1$  and wavelength  $\lambda_2$ .



App. No. 09/898781

Pre. Amd. Dated June 25, 2004

24. (Original) The optical pick-up according to claim 23, wherein when a distance between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source is d1, a distance between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source is d2, and a distance between the light emitting spots of the first and second semiconductor laser light sources is d12,

a distance between the center of the photo detecting portion PD1 and the light emitting spot of the first semiconductor laser light source is d1, and a distance between the center of the photo detecting portion PD2 and the light emitting spot of the second semiconductor laser light source is d2, and

the following relationship is substantially satisfied:

$$\lambda_1/\lambda_2 = d_1/d_2,$$

further the following relationship is substantially satisfied:

$$d_2 = d_1 + d_{12}, \text{ and}$$

the following relationships are substantially satisfied:

$$d_1 = \lambda_1 \cdot d_{12} / (\lambda_2 - \lambda_1)$$

$$d_2 = \lambda_2 \cdot d_{12} / (\lambda_2 - \lambda_1).$$

25. (Original) The optical pick-up according to claim 23, wherein the photo detecting portion PD1, the photo detecting portion PD2 and the photo detecting portion PD0 are divided into a plurality of regions respectively, and when information reproduction is carried out by using the light with wavelength  $\lambda_1$ , signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal; when information reproduction is carried out by using the light with wavelength  $\lambda_2$ , signals obtained from the region of the photo detecting

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

portion PD2 are calculated to detect a focus error signal; and signals obtained from the regions of the photo detecting portion PD0 are calculated to detect a tracking error signal.

26. (Original) The optical pick-up according to claim 23, wherein the photo detecting portion PD1, and the photo detecting portion PD2 are divided into a plurality of regions respectively, and when information reproduction is carried out by using the light with wavelength  $\lambda_1$ , signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal; and when information reproduction is carried out by using the light with wavelength  $\lambda_2$ , signals obtained from the regions of the photo detecting portion PD2 are calculated to detect a focus error signal, and

wherein the shape of the photo detecting portion PD1 is different from the photo detecting portion PD2.

27. (Original) The optical pick-up according to claim 23, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by dividing lines respectively and when information reproduction is carried out by using the light with wavelength  $\lambda_1$ , signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal; and when information reproduction is carried out by using the light with wavelength  $\lambda_2$ , signals obtained from the regions of the photo detecting portion PD2 are calculated to detect a focus error signal and,

wherein a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

28. (Original) The optical pick-up according to claim 23, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

29. (Original) The optical pick-up according to claim 23, further comprising a grating that forms a main beam and sub-beams that are  $\pm$ first order diffracted light by receiving a light beam with wavelength  $\lambda_2$  emitted from the second semiconductor laser light source when the wavelength  $\lambda_1$  is set to be in the range from 610 nm to 670 nm, and the wavelength  $\lambda_2$  is set to be in the range from 740 nm to 830 nm,

wherein a grating cross-sectional shape of the grating is substantially rectangular having concave and convex portions, the width of the concave portion and the width of the convex portion are substantially the same, and the level difference  $h$  between the concave portion and the convex portion of the cross sectional shape is represented by the following relationship when  $n_1$  denotes a refractive index of a material of the grating with respect to the wavelength  $\lambda_1$ :

$$h = \lambda_1 / (n_1 - 1), \text{ and}$$

the level difference in an optical path between the concave portion and the convex portion is set to be one wavelength.

30. (Original) The optical pick-up according to claim 29, wherein in both of the light beam with wavelength  $\lambda_1$  and the light beam with wavelength  $\lambda_2$ , a light beam entering an objective lens constituting the converging optical system without being diffracted by the grating, forms grating stripes in the entire range satisfying NA necessary to the reproduction of the optical disk.

31. (Original) The optical pick-up according to claim 23, wherein the wavelength  $\lambda_1$  is smaller than the wavelength  $\lambda_2$ , and the light emitting spot of the first semiconductor laser light source is arranged substantially on the optical axis of the converging optical system.

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

32. (Original) The optical pick-up according to claim 23, wherein the diffractive element has a focus error offset reducing region.

33. (Original) An optical disk apparatus comprising an optical pick-up according to claim 23, a moving mechanism for the optical pick-up and a rotation mechanism for rotating the optical disk.

34. (Original) An optical pick-up comprising:

a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;  
a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;  
a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beam into a microscopic spot on an optical disk;

a diffractive element for diffracting the light beam reflected by the optical disk; and  
a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,

wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving the light beam with wavelength  $\lambda_1$  in the diffracted light diffracted by the diffractive element; a photo detecting portion PD2 for receiving the light beam with wavelength  $\lambda_2$ , and a photo detecting portion PD0 for receiving the light beams with wavelength  $\lambda_1$  and wavelength  $\lambda_2$ ; and

wherein when information reproduction is carried out by using the light with wavelength  $\lambda_1$ , signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal; when information reproduction is carried out by using the light with wavelength  $\lambda_2$ , signals obtained from the regions of the photo detecting portion PD2 are

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

calculated to detect a focus error signal; and signals obtained from the regions of the photo detecting portion PDO are calculated to detect a tracking error signal.

35-38 (Canceled)

39. (Original) An image projection apparatus, comprising a projecting means for projecting an image onto a front glass of a car.

40. (Original) The image projection apparatus according to claim 39, further comprising an optical disk apparatus for recording or reproducing information on the optical disk, or an optical disk apparatus for recording and reproducing information, wherein the information reproduced from the optical disk apparatus is projected onto the front glass.

41. (Original) The image projecting apparatus according to claim 40, further comprising a converting circuit for converting the information reproduced by the optical disk apparatus into an image adjusted to the curvature of the front glass, wherein the information output from the converting circuit is projected onto the front glass.

42. (Original) A semiconductor laser apparatus, comprising  
a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;  
a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;  
and  
a photo detecting portion for receiving the light beam and for outputting a signal proportional to the amount of the diffracted light,  
wherein a distance d1 between the center of the photo detecting portion PDO and the light emitting spot of the first semiconductor laser light source and a distance d2 between the center of

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source substantially satisfy the following relationship:

$$\lambda_1/\lambda_2 = d_1/d_2.$$

43. (Original) The semiconductor laser apparatus according to claim 42, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

44 (Original) The semiconductor laser apparatus according to claim 42, wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving light with wavelength  $\lambda_1$  and a photo detecting portion PD2 for receiving light with wavelength  $\lambda_2$ , and the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions and the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

45. (Original) The semiconductor laser apparatus according to claim 42, wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving the light with wavelength  $\lambda_1$  and a photo detecting portion PD2 for receiving the light with  $\lambda_2$ , and wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by dividing lines, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

46. (Original) A semiconductor laser apparatus comprising:  
a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;  
and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting a signal proportional to the amount of the diffracted light,

wherein a distance  $d_1$  between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source, a distance  $d_2$  between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source, and the distance  $d_{12}$  between the light emitting spots of the first and second semiconductor laser light sources satisfy the following relationship:

$$d_2 = d_1 + d_{12}$$

and substantially satisfy the following relationships:

$$d_1 = \lambda_1 \cdot d_{12} / (\lambda_2 - \lambda_1)$$

$$d_2 = \lambda_2 \cdot d_{12} / (\lambda_2 - \lambda_1) .$$

47. (Original) The semiconductor laser apparatus according to claim 46, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

48. (Original) The semiconductor laser apparatus according to claim 46, wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a light with wavelength  $\lambda_1$  and a photo detecting portion PD2 for receiving a light with wavelength  $\lambda_2$ , and the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions and the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

App. No. 09/898781

Pre. Amd. Dated June 25, 2004

49. (Original) The semiconductor laser apparatus according to claim 46, wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving the light with wavelength  $\lambda_1$  and a photo detecting portion PD2 for receiving the light with  $\lambda_2$ , and wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by dividing lines, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

50. (Original) A semiconductor laser apparatus comprising:  
a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;  
a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;  
and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting a signal proportional to the amount of the diffracted light,

wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a light beam with wavelength  $\lambda_1$ , and a photo detecting portion PD2 for receiving a light beam with wavelength  $\lambda_2$ ; and a distance  $d_1$  between the center of the photo detecting portion PD1 and the light emitting spot of the first semiconductor laser light source and a distance  $d_2$  between the center of the photo detecting portion PD2 and the light emitting spot of the second semiconductor laser light source substantially satisfy the following relationship:

$$\lambda_1/\lambda_2 = d_1/d_2.$$

51. (Original) The semiconductor laser apparatus according to claim 50, wherein at least one of the photo detecting portion PD1 and the photo detecting portion PD2 is divided into any one of five strip-shaped regions, four strip-shaped regions and six strip-shaped regions.



App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

52. (Original) The semiconductor laser apparatus according to claim 50, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

53. (Original) The semiconductor laser apparatus according to claim 50, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions, and wherein the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

54. (Original) The semiconductor laser apparatus according to claim 50, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by a dividing line, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

55. (Original) A semiconductor laser apparatus, comprising:  
a first semiconductor laser light source for emitting a light beam with wavelength  $\lambda_1$ ;  
a second semiconductor laser light source for emitting a light beam with wavelength  $\lambda_2$ ;  
and  
a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,  
wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a light beam with wavelength  $\lambda_1$ , a photo detecting portion PD2 for receiving a light

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

beam with wavelength  $\lambda_2$ ; and a photo detecting portion PD0 for receiving both lights with wavelength  $\lambda_1$  and wavelength  $\lambda_2$ ,

wherein when a distance between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source is  $d_1$ , a distance between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source is  $d_2$ , and a distance between the light emitting spots of the first and second semiconductor laser light sources is  $d_{12}$ ,

a distance between the center of the photo detecting portion PD1 and the light emitting spot of the first semiconductor laser light source is  $d_1$ , and a distance between the center of the photo detecting portion PD2 and the light emitting spot of the second semiconductor laser light source is  $d_2$ ,

the following relationship is substantially satisfied:

$$\lambda_1/\lambda_2 = d_1/d_2,$$

further the following relationship is substantially satisfied:

$$d_2 = d_1 + d_{12}, \text{ and}$$

the following relationships are substantially satisfied:

$$d_1 = \lambda_1 \cdot d_{12} / (\lambda_2 - \lambda_1)$$

$$d_2 = \lambda_2 \cdot d_{12} / (\lambda_2 - \lambda_1).$$

56. (Original) The semiconductor laser apparatus according to claim 55, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

57. (Original) The semiconductor laser apparatus according to claim 55, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions

App. No. 09/898781  
Pre. Amd. Dated June 25, 2004

respectively, and the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

58. (Original) The semiconductor laser apparatus according to claim 55, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by a dividing line, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

59. (New) The optical pick up according to claim 3, wherein when d12 denotes a distance between the light emitting spot of the first semiconductor laser light source and the light emitting spot of the second semiconductor laser light source, a gap between the center of the photo detecting portion PD1 and the center of the photo detecting portion PD2 is set to be substantially twice d12.